

CLAIMS

1. Transmission device (1) for distributing a drive torque to at least two drive output shafts (7, 8) comprising at least two planetary gearsets (2, 3) each having at least three-shafts, such that a first respective shaft (4 or 5) of a planetary gearset (2 or 3) is connected to a drive input shaft (6) and a second respective shaft of a planetary gearset (2 or 3) constitutes one of the drive output shafts (7 or 8), characterized in that a third respective shaft (9, 10) of the planetary gearsets (2, 3) is in active connection with a brake (19, 20) in such manner that a degree of distribution of the drive torque between the two output shafts (7, 8) varies as a function of the transfer capacities of the brakes (19, 20).

2. Transmission device according to claim 1, characterized in that the first shaft (4) of the first planetary gearset (2) and the first shaft (5) of the second planetary gearset (3) are made as annular gears.

3. Transmission device according to claims 1 or 2, characterized in that the second shaft (7) of the first planetary gearset (2) and the second shaft (8) of the second planetary gearset (3) are made as planetary carriers.

4. Transmission device according to any of claims 1 to 3, characterized in that the third shaft (9) of the first planetary gearset (2) and the third shaft (10) of the second planetary gearset (3) are made as solar gears.

5. Transmission device according to any of claims 1 to 4, characterized in that between the two third shafts (9, 10) of the planetary gearsets (2, 3) is provided an active connection (11) which can be engaged and which is made with a third planetary gearset (23).

6. Transmission device according to claim 5, characterized in that the third shaft (9) of the first planetary gearset (2) can be connected to a first shaft (24) of the third planetary gearset (23).

7. Transmission device according to claims 5 or 6, characterized in that the third shaft (10) of the second planetary gearset (3) can be connected to a third shaft (25) of the third planetary gearset (23).

8. Transmission device according to any of claims 5 to 7, characterized in that the active connection (11) between the third shaft (9) of the first planetary gearset (2) and the third shaft (10) of the second planetary gearset (3) can be engaged by means of a clutch (22) arranged between the third shaft (9) of the first planetary gearset (2) and the first shaft (24) of the third planetary gearset (23) or the third shaft (10) of the second planetary gearset (3) and the third shaft (25) of the third planetary gearset (23).

9. Transmission device according to any of claims 5 to 8, characterized in that a second shaft (27) of the third planetary gearset (23) is fixed on the housing.

10. Transmission device according to any of claims 5 to 9, characterized in that the first shaft (24) of the third planetary gearset (23) is made as an annular gear.

11. Transmission device according to any of claims 5 to 10, characterized in that the second shaft (27) of the third planetary gearset (23) is made as a planetary carrier.

12. Transmission device according to any of claims 5 to 11, characterized in that the third shaft (25) of the third planetary gearset (23) is made as a solar gear.

13. Method for controlling and regulating a transmission device (1) according to any of the preceding claims, characterized in that to distribute a drive torque of a power source between the two output shafts (7, 8) of the transmission device (1), the transfer capacities of the two brakes (19, 20) are adjusted in such manner that one brake (19 or 20) is engaged and the transfer capacity of the other brake (20 or 19) is varied between a lower limiting value ($W(u)$) and an upper limiting value ($W(o)$), which preferably corresponds to an engaged condition of the brakes (k_{VA} , k_{HA}).

14. Method according to claim 13, characterized in that when the transfer capacity of the brakes (19, 20) corresponds to the lower limiting value ($W(u)$) essentially no torque is supported by the brakes (19, 20) and when the brakes (19, 20) are engaged a torque applied to a brake (19 or 20) is supported in full.

15. Method according to claims 13 or 14, characterized in that when the transfer capacity of a brake (19 or 20) corresponds to the lower limiting value ($W(u)$), essentially no drive torque is transferred to the output shaft (7 or 8) of a planetary gearset (2 or 3) associated with the said brake (19 or 20), and the drive torque from the power source applied to the transmission device (1) is transferred essentially completely to the output shaft (8 or 7) of the other planetary gearset (3 or 2) associated with the brake (20 or 19) which is engaged at the same time.

16. Method according to any of claims 13 to 15, characterized in that a degree of distribution of the drive torque between the two output shafts (7, 8) varies as a function of the transfer capacity of the brake (19 or 20) whose transfer capacity is being changed.

17. Drivetrain (28) of a vehicle with at least two driven vehicle axles (29, 30) and at least one transmission device (1) according to any of the preceding claims, characterized in that the transmission device (1) is arranged in a power path between a power source and the vehicle axles (29, 30) to distribute the drive torque from the power source between the vehicle axles (29, 30) as necessary and in a manner that depends on the operating situation, and/or in a power path of a vehicle axle (29 or 30) to distribute the fraction of the drive torque delivered to the said vehicle axle (29 or 30) in the transverse direction of the vehicle between two drive wheels of the said vehicle axle (29 or 30) as necessary and in a manner that depends on the operating situation.

18. Drivetrain according to claim 17, characterized in that the power path between the power source and the vehicle axles (29, 30) is provided with a controllable clutch (22) for the distribution of the drive torque from the power source between the vehicle axles (29, 30) as necessary and in a manner that depends on the operating situation.

19. Drivetrain according to claim 17, characterized in that for the distribution of the drive torque from the power source between the vehicle axles (29, 30) as necessary and in a manner that depends on the operating situation, the power path between the power source and the vehicle axles (29, 30) is provided with a device (32) which, when there is a speed difference between the vehicle

axles (29, 30), builds up a hydraulic pressure by means of a pump system (32A), with which frictional elements (32B) that can be brought into frictional engagement can be acted upon in such manner that a speed-difference-reducing torque can be applied to each of the two vehicle axles (29, 30).

20. Drivetrain according to any of claims 17 to 19, characterized in that for the distribution of the fraction of the drive torque delivered to one of the vehicle axles (29 or 30) in the transverse direction of the vehicle between two drive wheels on the said vehicle axle (29 or 30) as necessary and in a manner which depends on the driving situation, a controlled differential lock (35) is arranged in the power path of the said axle (29 or 30).

21. Drivetrain according to any of claims 17 to 20, characterized in that for the distribution of the fraction of the drive torque delivered to one of the vehicle axles (29 or 30) in the transverse direction of the vehicle between two drive wheels on the said vehicle axle (29 or 30) as necessary and in a manner which depends on the driving situation, the power path of the said axle (29 or 30) incorporates an open differential (33).